AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
Serial Number: 10/822,553
Filing Date: April 12, 2004
Title: BRANCH PREDICTION APPARATUS, SYSTEMS, AND METHODS

Page 11
Dkt: 888.013US1

REMARKS

This communication responds to the Office Action mailed on September 12, 2006.
Claims 1, 6, 10, 14, 25, 31, 34-35, and 38 are amended, no claims are canceled, and no claims
are added. As a result, claims 1-41 are now pending in this Application.

Priority

The Examiner noted that "the application discloses and claims subject matter disclosed in
prior Application Serial No. 60/462,513, filed April 11, 2003 ...". The Examiner and
Applicants' attorney Mark V. Muller reached agreement in a teleconference on November 1,
2006 that the instant Application has properly claimed priority to the referenced provisional
application so as to obtain the benefit of its prior filing date.

Oath/Declaration

The Office asserts that the oath or declaration is defective because the signature for
inventor Tao Li has not been dated. The Applicants enclose a copy of the declaration as it
appears in the USPTO PAIR system, attached hereto as Appendix A. This document has been
signed and dated "Dec. 2 2004" by Mr. Li, prior to filing with the United States Patent and
Trademark Office on January 24, 2005. Therefore, Applicants request reconsideration and
withdrawal of the request for a new oath or declaration.

Drawings

The Office has objected to the drawings for failing to comply with 37 CFR 1.84(p)(4),
asserting that reference character "134" has been used to designate both the bits of the U-BHSR
and the bits of U-BHT in figure 1B. However, as noted in the Application, label 134 is for
"branch history information" associated with a second operating context. This information 134
may be stored in the storage location 132 (U-BHSR) and/or split branch history table 137 (U-
BHT). See Application, paras. [0015] – [0016]. Label 118, which is used to designate branch
history information associated with a first operating context, is used in a similar manner with

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Serial Number: 10/822,553
Filing Date: April 12, 2004
Title: BRANCH PREDICTION APPARATUS, SYSTEMS, AND METHODS

Page 12
Dkt: 888.013US1

respect to the storage location 114 (K-BHSR) and the split branch history table 137. Thus, the Applicants respectfully decline to amend the drawings at this time, and invite further inquiry from the Examiner if the labeling scheme of FIG. 1B is still not clear.

Title of the Application

An objection was raised to the title of the Application as being insufficiently descriptive. The Applicants appreciate the Examiner's suggestion of language for an amended title, and have implemented the amendment in the manner suggested.

§101 Rejection of the Claims

Claims 1-9, 10-13, and 31-34 were rejected under 35 U.S.C. § 101 as being directed to a non-statutory subject matter, with the particular assertion being made that a "machine-accessible medium is not statutory subject matter." The Applicant respectfully traverses.

As noted in the Guidelines for examination, "If the examiner determines that the claim does not entail the transformation of an article, then the examiner shall review the claim to determine if the claim provides a practical application that produces a useful, tangible and concrete result. In determining whether the claim is for a 'practical application,' **the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is 'useful, tangible and concrete.'**" AT&T, 172 F.3d at 1358-59, 50 USPQ2d at 1452. *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (hereinafter, the "Guidelines"), pg. 20, October 2005. (emphasis added)

With respect to the Applicant's claims 1-9 and 31-34, it is respectfully noted that accessing branch history in storage locations included in a split branch history shift register predictor to predict a branch based on the history is **useful**, i.e. "(i) specific, (ii) substantial and (iii) credible ..." [*Id.* at pg. 20] (e.g., accessing the predictor reduces branch aliasing during the execution of applications), and "[i]f the applicant has asserted that the claimed invention is useful for any particular practical purpose (i.e., it has a 'specific and substantial utility') and the assertion would be considered credible by a person of ordinary skill in the art, [then one should] not impose a rejection based on lack of utility." M.P.E.P. § 2107.I).

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
Serial Number: 10/822,553
Filing Date: April 12, 2004
Title: BRANCH PREDICTION APPARATUS, SYSTEMS, AND METHODS

Page 13
Dkt: 888.013US1

Accessing branch history in storage locations included in a split branch history shift register predictor is also **tangible**, since it speeds up application execution (i.e., reducing branch aliasing reduces computation time), and **concrete**, since the results of the prediction are substantially repeatable.

With respect to claims 10-13, the Applicants' claimed article of manufacture, comprising a machine-accessible medium including a memory, is clearly within the ambit of 35 U.S.C. § 101, viz:

> The plain and unambiguous meaning of section 101 is that any new and useful process, machine, *manufacture*, or composition of matter, or any new and useful improvement thereof, may be patented if it meets the requirements for patentability set forth in Title 35, such as those found in sections 102, 103, and 112. The use of the expansive term "any" in section 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in section 101 and the other parts of Title 35.... Thus, it is improper to read into section 101 limitations as to the subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations. Guidelines, pg. 12 (citing Alappat, 33 F.3d at 1542, 31 USPQ2d at 1556). (emphasis added)

Given the teaching provided by the Guidelines, claims 1-9, 10-13, and 31-34 constitute patentable subject matter, and the rejection of these claims under 35 U.S.C. § 101 is improper. Therefore, the Applicants respectfully request that the Office reconsider and withdraw the rejection of the claims under 35 U.S.C. § 101.

§*102 Rejection of the Claims*

Claims 1-25 and 27-41 were rejected under 35 U.S.C. § 102(b) for anticipation by Li et al. (Improving Branch Predictability in Java Processing; hereinafter "Li"). The Applicants do not admit that Li is prior art and reserve the right to swear behind this reference at a later date. In addition, because the Applicants do not believe the Office has established a proper *prima facie* case of anticipation with respect to the amended claims, this rejection of the claims is respectfully traversed.

Anticipation under 35 USC § 102 requires the disclosure in a single prior art reference of each element of the claim under consideration. *See Verdegaal Bros. V. Union Oil Co. of*

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
Serial Number: 10/822,553
Filing Date: April 12, 2004
Title: BRANCH PREDICTION APPARATUS, SYSTEMS, AND METHODS

Page 14
Dkt: 888.013US1

California, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, "[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim." Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.,* 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.,* 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). "The *identical invention* must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP § 2131 (emphasis added).

Independent claims 1, 10, 14, 25, 31, 35, and 38 have been amended to recite the presence and/or use of a "split branch history shift register predictor." Claims 6 and 34 have been amended to be consistent with their respective amended independent claims, and not for reasons related to patentability. This element is shown in FIG. 1A, and described in the Application as follows:

> It is noted that in the apparatus 100 and system 140 described herein may be implemented in the form of a Gshare predictor. The disclosed embodiments can be applied to other correlation-based predictors as well. For example, a Gshare predictor with split correlation history shift registers (e.g., a split BHSR predictor) 152 can be seen in FIG. 1A. The split BHSR predictor 152 may operate so that two dedicated BHSRs (i.e., U-BHSR for user context and K-BHSR for kernel context) are used to gather branch correlation patterns and to generate BHT indexing. Application, para. [0017].

The Applicants were unable to find any evidence of this element being taught or suggested by Li. Therefore, since Li does not teach the identical invention claimed by the Applicant, a *prima facie* case of anticipation has not been properly established, and independent claims 1, 10, 14, 25, 31, 35, and 38 (as well as all claims depending from them) should be in condition for allowance. Reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(b) is respectfully requested.

§103 Rejection of the Claims

Claim 26 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Li. However, since a *prima facia* case of obviousness has not been established in this case, the Applicant respectfully traverses this rejection.

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d (BNA) 1596, 1598 (Fed. Cir. 1988). In combining prior art references to construct a *prima facie* case, the Examiner must show some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art that would lead an individual to combine the relevant teaching of the references. *Id.* The M.P.E.P. contains explicit direction to the Examiner that agrees with the *In re Fine* court:

> In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellants disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 1991)).

No proper *prima facie* case of obviousness has been established because no modification of Li has been suggested to provide a system having storage locations that form "a portion of a split branch history shift register predictor", as claimed by the Applicants. Thus, the rejection of claim 26 under 35 U.S.C. § 103(a) is improper. Reconsideration and withdrawal of the rejection are respectfully requested.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
Serial Number: 10/822,553
Filing Date: April 12, 2004
Title: BRANCH PREDICTION APPARATUS, SYSTEMS, AND METHODS

Page 16
Dkt: 888.013US1

CONCLUSION

The Applicants respectfully submit that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone the Applicants' attorney at (210) 308-5677 to facilitate prosecution of this Application. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.
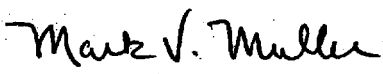
Respectfully submitted,

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By their Representatives,

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Date   December 1, 2006   By _____
                                  Mark V. Muller
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 1st day of December 2006.

PATRICIA A. HULTMAN _____

Name   Signature